IN THE CLAIMS:

Claim 11. (New) A method for detecting corners of an input image document placed on a platen of a scanning device with said input image document directed in such a manner that a leading edge of said document will be the first edge read by said scanning device, the actual physical corners of the input document denoted as C_0, C_1, C_2, and C_3 representing respective physical corners of the document, and as the input document travels through said scanning device, a full width array reads the background of said scanning device until the input document crosses an optical path between a light source and said full width array, said method comprising the steps of:

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a) generating edge data from a transition point of the input image document into the optical path, further comprising the step of determining a page width value of the input document from values obtained from sensors which are set prior to the feeding of said input document into the scanning area;

b) setting a video-image coordinate value VC_0 representing one corner of said input document, video-image coordinate VC_0 wherein the coordinate value of VC_0 is determined by analyzing image data being received by said scanning device and is defined as (SC_0, PC_0) such that SC_0 is a scanline location value PC_0 is a pixel location value;

c) and once said video-image coordinate value VC_0 is determined, continuing to receive said image data such that a center coordinate value of said input document can be determined;

d) after said center value has been determined, creating a first white fill area which is initially one scanline high and equal in width to the page width (fast scan direction length) of said input image document;

e) determining whether a predetermined number of scanlines have been processed since the setting of said center value and, if a predetermined number of scanlines have not been processed, further analyzing said image data until the presence of said physical corner C_1 of said input document is detected and, if a predetermined number of scanlines have been processed, setting image-value coordinate value VC_1 to a default value;

f) if said document is scewed, determining a skew angle of said input document and undetected corners C_2 and C_3 from the values of video-image coordinates VC_0 and VC_1 and calculating values for video-image coordinates VC_2 and VC_3 in order to generate second and third white fill areas so as to bound the actual image area;

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g) generating an output image such ~~that said~~ output image is bounded by a first corner having the corner value associated with the pixel value of VC0 and the scanline value of VC_1, a second corner bounded by an area having the coordinate value of the pixel value of VC_2 (PC_2) and the scanline value of VC_1 (SC_1) and a third corner having the pixel value of VC_2 (PC_2), a the scanline value of VC_3 (SC_3), and a fourth corner having a pixel value VC_0 (PC_0) and a scanline value of VC_3 value (SC_3); and

h) transferring said bounded output input to an output device.

Claim 12. (New) As in claim 1, wherein said edge data represents as a transition between said image data representing a background of the platen cover or the background of a constant velocity transport device and a leading edge of said input document.

Claim 13. (New) As in claim 1, wherein said physical corner C_0 of said input document is determined by analyzing said edge data and, if the physical corner C_0 is not determined to be within a predetermined number of scanlines, then defaulting the value of video-image coordinate VC_0 to first default value a known value.

Claim 14. (New) As in claim 3, further comprising the step of setting the video-image coordinate VC_0 (SC_O, PC_O) to a value equal to a measured coordinate value of the physical corner C_0 of said input document when said physical corner of said input document is detected.

Claim 15. (New) As in claim 1, further comprising the step of determining whether the value of video-image coordinate VC_0 is within a predetermined number of scanlines from the start of the scanning process such that the value SC_O is less than or equal to a predetermined scanline value and, if the value of VC_0 is not within a predetermined number of lines, then defaulting the value of VC_0 to a second default value.

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Claim 16. (New) As in claim 5, further comprising the steps of determining if the value of video-image coordinate VC_0 is within a predetermined number of pixels from a nominal center value such that the value of PC_O is within a predetermined number of pixels of the nominal center value, said center value being a coordinate value wherein a fast scan coordinate is already known by the position of the nominal center pixel of the full width array and wherein a slow scan coordinate is known to be equal to the total number of scanlines processed.

Claim 17. (New) As in claim 6, further comprising the step of relating the nominal center value to the center of the area being scanned such that the value corresponding to the pixel of the full width array is centered in the fast scan direction for a particular paper width (i.e., if the full width array is 11 inches wide, the nominal center value will correspond to the pixel located at 5.5 inches).

Claim 18. (New) As in claim 6, if the value of VC_0 is not to be within a predetermined number of pixels of the nominal center pixel, determining whether VC_0 was detected before the nominal center pixel and, if VC_0 was not detected before the nominal center pixel, setting VC_0 to a third default value and, if the VC_0 was detected before the nominal center pixel, keeping the value of coordinate VC_0 the same.

Claim 19. (New) As in claim 1, wherein said step of determining said center point further comprises the step of monitoring the nominal center pixel of the full width array for the presence of edge data and, when edge data is determined to be present then the center of the input document has been detected and, if the center of the document has not been detected, determining whether a predetermined number of scanlines have already been processed.

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Claim 20. (New) As in claim 9, wherein the step of detecting the center of the input document further comprises implementing a counter in order to track the number of scanlines that have been processed.

Claim 21. (New) As in claim 10, further comprising the steps of setting a center value if a predetermined number of scanlines have been processed and, if edge data is detected at the nominal center pixel, then setting the center value to the value corresponding to the position of the detected leading edge data.

Claim 22. (New) As in claim 1, further comprising the step of determining, upon initiating the creation of the first white fill area, whether a physical corner coordinate C_1 of said input document has been detected and, if the physical corner C_1 of the input document has not been detected, adding a scanline to the first white fill area.

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Claim 23. (New) As in claim 1, determining whether a predetermined number of scanlines have been processed since the setting of said center value and, if a predetermined number of scanlines have not been processed, further analyzing said image data until the presence of said physical corner C_1 of said input document is detected and, if a predetermined number of scanlines have been processed, setting image-value coordinate value VC_1 to a default value, if the presence of the physical corner C_1 of the input document is detected, determining whether the detection of this corner is closer than a predetermined number of pixels from the nominal center pixel of the full width array and, if the detected physical corner C_1 of the input document is closer than the predetermined number of pixels from the nominal center pixel of the full width array (indicating that said document is either dog-eared or black edged) then defaulting the value of video-image coordinate VC_1.

Claim 24. (New) As in claim 12, if the detected physical corner of the input document is not closer than a predetermined number of pixels from the nominal center, setting the video-image coordinate value VC_1 to the detected value.

Claim 25. (New) As in claim 1, determining whether a predetermined number of scanlines have been processed since the setting of said center value and, if a predetermined number of scanlines have not been processed, further analyzing said image data until the presence of said physical corner C_1 of said input document is detected and, if a predetermined number of scanlines have been processed, setting image-value coordinate value VC_1 to a default value, if the input document is not skewed, generating a full scanline of edge data by said full width array and, if said input document is skewed, creating a partial scanline of edge data by said first corner of said input document transitioning into said optical path.

Claim 26. (New) As in claim 14, further comprising the step of monitoring the center pixel of the full width array in order to determine when that pixel produces edge data and, when the center cell produces edge data, determining said center value of the input document.

Claim 27. (New) As in claim 14, further comprising the step of establishing, upon determining the center value of the input document, a boundary of the first white field area, said first white field area incrementally increasing in area, scanline by scanline, until the detection of video-image coordinate value for VC_1, such that the width of the first white filled area is equal to the number of scanlines between the center value and the detected physical corner C_1.

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Claim 28. (New) As in claim 1, if said document is scewed, determining a skew angle of said input document and undetected corners C_2 and C_3 from the values of video-image coordinates VC_0 and VC_1 and calculating values for video-image coordinates VC_2 and VC_3 in order to generate second and third white fill areas so as to bound the actual image area, further comprising the step of rotating said output image such that the physical corner coordinates C_0, C_1, C_2, and C_3 are transformed to newly calculated output image corners to de-skew said output image.

Claim 29. (New) As in claim 1, generating an output image such that said output image is bounded by a first corner having the corner value associated with the pixel value of VC0 and the scanline value of VC_1, a second corner bounded by an area having the coordinate value of the pixel value of VC_2 (PC_2) and the scanline value of VC_1 (SC_1) and a third corner having the pixel value of VC_2 (PC_2), a the scanline value of VC_3 (SC_3), and a fourth corner having a pixel value VC_0 (PC_0) and a scanline value of VC_3 value (SC_3), further comprising the step of increasing the output image area by reading an edge point along a first edge at the line where the center of the input document is detected.

Claim 30. (New) As in claim 1, generating an output image such that said output image is bounded by a first corner having the corner value associated with the pixel value of VC0 and the scanline value of VC_1, a second corner bounded by an area having the coordinate value of the pixel value of VC_2 (PC_2) and the scanline value of VC_1 (SC_1) and a third corner having the pixel value of VC_2 (PC_2), a the scanline value of VC_3 (SC_3), and a fourth corner having a pixel value VC_0 (PC_0) and a scanline value of VC_3 value (SC_3), further comprises the step of applying a border of white-masking windows to the output image in order to prevent a black backup roll from appearing on the printed output as black borders thereby providing a user with a maximum amount of image area.

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Claim 31. (New) As in claim 1, generating an output image such that said output image is bounded by a first corner having the corner value associated with the pixel value of VC0 and the scanline value of VC_1, a second corner bounded by an area having the coordinate value of the pixel value of VC_2 (PC_2) and the scanline value of VC_1 (SC_1) and a third corner having the pixel value of VC_2 (PC_2), a the scanline value of VC_3 (SC_3), and a fourth corner having a pixel value VC_0 (PC_0) and a scanline value of VC_3 value (SC_3), further comprises the step of utilizing at least one white-masking window to prevent black wedges from being imaged on the fast scan start and end edge and the slow scan trailing edge of the output image wherein the locations of the corners C0 and C1 are used outside of said white-masking window to frame said output image.